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New data on the occurrence of lacewings (Neuroptera) in Georgia

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ABSTRACT. **New data on the occurrence of lacewings (Neuroptera) in Georgia.**
New data on the Neuroptera of Georgia are presented. Eighteen species are reported, six of which – *Wesmaelius* (*K.*) *nervosus*, *Cueta lineosa*, *Neuroleon microstenus propinquus*, *Neuroleon nemausiensis piryulini*, *Neuroleon* (*G.*) *lukhtanovi* and *Nedroledon maculatus* – are new for Georgia.

KEY WORDS: faunistics, Caucasus, Ascalaphidae, Chrysopidae, Hemerobiidae, Myrmeleontidae.

INTRODUCTION

The natural history of Georgia makes it one of the most interesting regions of the Caucasus in this respect: its insect fauna is rich and in many cases endemic. Data on its lacewings have been published in many papers. In view of the many geopolitical changes that have taken place in this part of the Caucasus in the 20th and 21st centuries, it is often hard to allocate this faunistic information in particular states and autonomous republics in the larger Caucasian region. A creditable attempt to systematize the faunistic data relating to Neuroptera was made in the early 1990s (Zakharenko & Krivokhatsky 1993). However, only 32 neuropteran species from Georgia found their way into the catalogue of the Neuropteroidea of the Western Palearctic at the start of the 21st century (Aspöck *et al.* 2001). As a result of two expeditions, each of several weeks' duration, in 2012-2013, 31 further species were added to that list (Duelli *et al.* 2015). This latter paper contains a complete list of all the species of Neuroptera found so far in Georgia, together with an interesting zoogeographical analysis of the origin and similarities of the neuropteran fauna of this region. In recent years a number of interesting papers on the regions and areas bordering on Georgia or lying within the larger Caucasian region have been published (Ábrahám 2000, Krivokhatsky 2007, Ilyina & Krivokhatsky 2012, Khabiev & Krivokhatsky 2014, Krivokhatsky *et al*. 2016, Makarkin & Shchurov 2010, 2011, 2015).

MATERIAL AND METHODS

In recent times Georgia has become a favoured destination for entomological research expeditions. The lacewings described in this paper were caught incidentally during expeditions of Polish and Czech entomologists. In 2011−2014 staff from the Forest Research Institute organized three expeditions (29 June – 9 July 2011, 25 May – 5 June 2012 and 28 April – 6 May 2014); the material for the present paper was collected during the last expedition (Lagodekhi National Park). The main research objective of these three visits to Georgia was to collect materials – voucher specimens – for getting to know the coleopteran fauna of this region. The fieldwork was carried out in cooperation with Professor George Japoshvili from the Agricultural University of Georgia (Tbilisi). Hence, specimens were also trapped at times when the Polish entomologists were not in Georgia. From 1 May to 4 October 2014 a number of yellow pan or Moericke traps (ø 20 cm) were deployed in the Lagodekhi National Park. The pans were filled with a ca 40% ethylene glycol in water with added detergent. All the pans were suspended from branches 2-2.5 m above the ground in sunny spots (Fig. 1). The Moericke traps were hung in the neighbourhood of other types of traps like violet multi-funnel traps and Malaise traps. The traps were monitored every two weeks by staff from the Agricultural University of Georgia (Tbilisi), and the material despatched to Poland. The main aim of using Moericke traps was to catch anthophilous beetles; as lacewings were among the trapped insects, these were cherry-picked and sent to the first-named author of this paper.

In June 2014 entomologists from the Czech Republic were also doing research in Georgia. The specimens of antlions and owlflies (Myrmeleontidae and Ascalaphidae) that they donated to the collections of the Upper Silesian Museum, Bytom, have been included in the present paper.

In 2015 and 2016 two scientific expeditions to Georgia were organized by entomologists from Poznań (19–31 August 2015; 10–18 May 2016). Their chief aim was to study the butterflies and moths of Georgia. They used the trapping methods standard for Lepidoptera including battery-powered black light traps (3×6W) from dusk until dawn, and screens with a mixed light (mix 2×250W) from dusk to 03:00–04:00 in the morning. All the lacewings were captured either on the black light or the mixed light screen.

This paper also describes two specimens of *Wesmaelius nervosus*, a species new to Georgia, from the ZIN collection (St. Petersburg). The whole collection of Georgian lacewings in the ZIN collection will be described in a separate paper. All the other voucher specimens are in the collections of the Upper Silesian Museum, Bytom.

Abbreviations:

USMB – Upper Silesian Museum, Bytom, Poland

ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia

Species new to Georgia are marked with an asterisk (*).

Fig. 1. Yellow pan traps and violet multi-funnel trap in the Lagodekhi National Park (photo R. Plewa, 2014).

Ryc. 1. Żółte miski oraz fioletowa pułapka lejkowa w Parku Narodowym Lagodekhi (fot. R. Plewa, 2014).

RESULTS

Nineta flava (Scopoli, 1763)

7♀♀ – 05.08–04.09.2014, Lagodekhi National Park 41°51'N 46°17'E, 666 m asl, yellow pan trap, leg. R. Plewa.

Its distribution area spreads from the deciduous woodland zone in Europe to Asia Minor and the Caucasian region (Zakharenko & Krivokhatsky 1993).

Chrysopidia* (*Chrysotropia*) *ciliata (Wesmael, 1841)

27♂♂ 19♀♀ [in ethanol] – 26.07–05.08.2014, Lagodekhi National Park 41°51'N 46°17'E, 666 m asl, yellow pan trap, leg. R. Plewa (USMB 016/A10; USMB 016/B1; USMB 016/B2).

Large numbers of this species have been recorded in many localities in the Caucasian Region, especially in damp forests (Ábrahám 2000, Duelli *et al.* 2015).

Chrysopa formosa Brauer, 1850

1♂ – 22–23.08.2015, Lagodekhi NP 41°50'N 46°16'E, 565 m asl, at light, leg. Roman Wąsala.

This species has been recorded in many localities in the Caucasian region (Ábrahám 2000).

Pseudomallada prasinus (Burmeister, 1839)

1♀ – 20–21.08.2015, Vashlovani NP., Mijnis Kure 41°06'N 46°38'E, 97 m asl, at light, leg. R. Wąsala.

This very abundant species is widespread in the countries of the former Soviet Union, and also in the Caucasian region (Zakharenko & Krivokhatsky 1993).

Cunctochrysa albolineata (Killington, 1935)

2♀♀ – 05.08–04.09.2014, Lagodekhi National Park 41°51'N 46°17'E, 666 m asl, yellow pan trap, leg. R. Plewa.

This species, like the previous one, is common and widespread in the Caucasian region (Ábrahám 2000, Zakharenko & Krivokhatsky 1993).

Chrysoperla carnea (Stephens,1836) s.l.

1♀ – 05.08–04.09.2014, Lagodekhi National Park 41°51'N 46°17'E, 666 m asl, yellow pan trap, leg. R. Plewa.

Seven cryptic valid species from the genus *Chrysoperla* Steinmann, 1964 are reported from Georgia by Duelli *et al.* (2015).

* ***Wesmaelius*** (***Kimminsia***) ***nervosus*** (Fabricius, 1793)

2♀♀ – 2.06.1986, Лагодехи заповедник [Lagodekhi National Park], близ метеост. [near meteost.] H=2100 м, [leg.] Львовский [Lvovskij] (ZIN).

A widespread and abundant element of the Siberian fauna, this species is also found quite frequently in the Caucasus. It has been recorded, e.g. in neighbouring Chechnya-Ingushetia (Ábrahám 2000).

* ***Cueta lineosa*** (Rambur, 1842)

1♀ – 27–28.08.2015, Vashlovani NP., Mijnis Kure 41°06'N 46°38'E, 97 m asl, at light, leg. R. Wąsala.

A widespread species, known from SE Europe, N Africa, and Asia from Turkey, the Caucasus, Iran, Iraq and the Arabian Peninsula to Turkmenistan, Uzbekistan, Afghanistan and Pakistan (Aspöck *et al.* 2001). In the Caucasian region known only from Armenia and Azerbaijan (Zakharenko & Krivokhatsky 1993).

Euroleon nostras Esben-Petersen, 1918

1♀ – 27–28.08.2015, Vashlovani NP., Visitor Centre 41°11'N 46°32'E, 350 m asl, black light, leg. R. Wąsala.

A common and widespread species. In the Caucasian region known from Stavropol and Krasnodar krai, Kabardino–Balkaria, Dagestan, Azerbaijan, Armenia and Georgia (Zakharenko & Krivokhatsky 1993).

Dendroleon pantherinus (Fabricius, 1787)

1♀ – 26.07–05.08.2014 and 2 ♀♀ – 05.08–04.09.2014, Lagodekhi National Park 41°51'N 46°17'E, 666 m asl, yellow pan trap, leg. R. Plewa.

This antlion occurs in Europe, from France to Romania, along the Black Sea coast to Ukraine, and also in Turkey, Georgia and Russia. In the east, its range extends as far as the Autonomous Republic of Dagestan and Azerbaijan. Some authors are of the opinion that the disjunctive range of this species also includes eastern China, but these data probably refer to other species, not identified with 100% certainty (Krivokhatsky 2007, Zakharenko & Krivokhatsky 1993). *D. pantherinus* is a nocturnal species, local and scarce throughout its range. The predaceous larvae live mainly in old tree hollows, in damp but well insolated oak forests. It also lives in other types of mature forest with large numbers of trees with hollows. In some parts of Europe its larvae have been found in the attics of old country cottages (L. Ábrahám pers. information).

At the global scale, this species is a stenobiont par excellence: it is thus protected in many European countries. Its rarity is also a consequence of its biology, which is associated with particular habitats (rotten wood in old tree hollows), which are primarily affected by natural disasters and human pressure.

The environment in which the specimens of this species were caught in the Lagodekhi National Park is shown on the photograph (Fig. 2)

Fig. 2. Habitat of *Dendroleon pantherinus* (F.) in the Lagodekhi National Park (photo R. Plewa, 2014).

Ryc. 2. Środowisko występowania *Dendroleon pantherinus* (F.) na terenie Parku Narodowego Lagodekhi (fot. R. Plewa, 2014).

* ***Neuroleon microstenus propinquus*** (Navás, 1912)

2♀♀ – 20–21.08.2015, Vashlovani NP., Visitor Centre 41°11'N 46°32'E, 350 m asl, black light, leg. R. Wąsala.

Neither this subspecies nor the nominate one have so far been recorded in the Caucasian region. *N. microstenus* is known in Europe from the countries of the Mediterranean Basin and from Hungary, Bulgaria, Romania and Ukraine; also from Morocco and Algeria, and from Turkey, Syria, Lebanon, Israel, Azerbaijan and Armenia (Aspöck *et al.* 2001, Krivokhatsky 2011).

* ***Neuroleon nemausiensis piryulini*** (Krivokhatsky, 2011)

1♀ – 27–28.08.2015, Vashlovani NP., Visitor Centre 41°11'N 46°32'E, 350 m asl, black light, leg. R. Wąsala.

The nominate subspeci.s is widespread from Spain to the Caucasus. The subspecies *N. nemausiensis piryulini* from the territory of the former Soviet Union is known from Ukraine, Kazakhstan and Russia (the Rostov, Saratov, Astrakhan and Volgograd regions as well as Dagestan and Kalmykia) (Krivokhatsky *et al.* 2016). Another subspecies, *N. nemausiensis nigriventris*, is found further to the east, as far as Mongolia and China (Krivokhatsky 2011). *N. nemausiensis piryulini* was found in the Krasnodar Region, the first record from the Caucasian region (Shurov & Makarkin 2013).

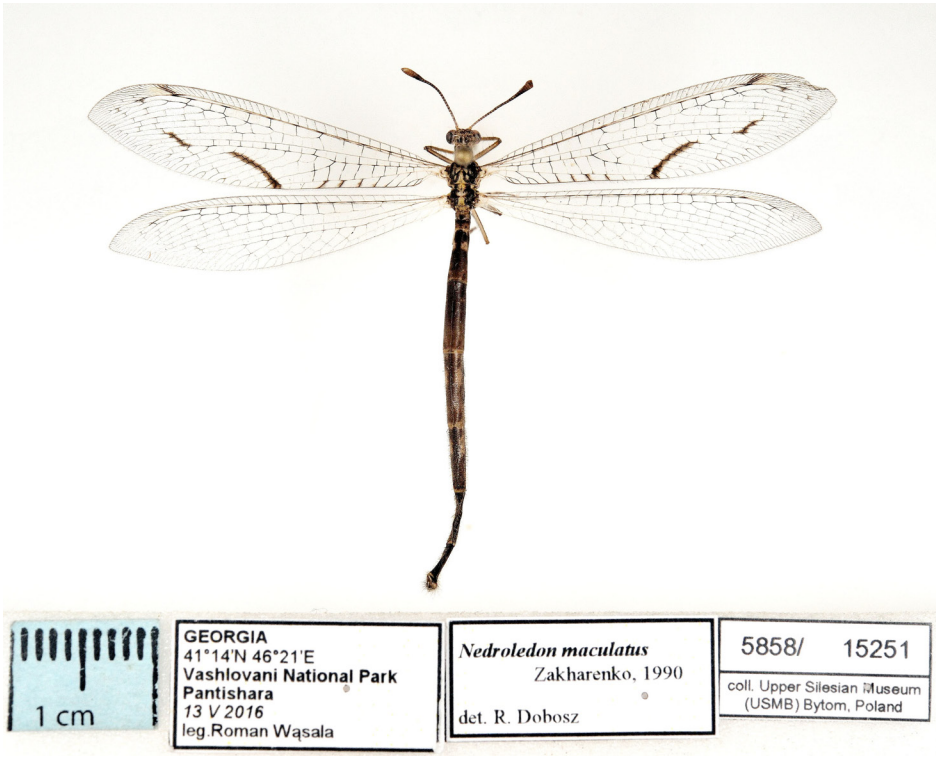

Fig. 3. A male of *Nedroledon maculatus* from the Vashlovani National Park (photo A. Larysz).

Ryc. 3. Samiec *Nedroledon maculatus* z Parku Narodowego Vashlovani (fot. A. Larysz).

* ***Neuroleon*** (***Ganussa***) ***lukhtanovi*** Krivokhatsky, 1996

1♀ – 27–28.08.2015, Vashlovani NP., Visitor Centre 41°11'N 46°32'E, 350 m asl, black light, leg. R. Wąsala.

This rare species has been recorded for the first time in the Caucasian region from Dagestan (Khabiev & Krivokhatsky 2014).

A species known from Tajikistan, Turkmenistan, Uzbekistan and Iran (Krivokhatsky 1996, Mirmoayedi *et al.* 1998, 2015).

Creoleon plumbeus (Olivier, 1811)

1♂2♀♀ – 20–21.08.2015, Vashlovani NP., Mijnis Kure 41°06'N 46°38'E, 97 m asl, at light, leg. R. Wąsala.

In the Caucasus known from Dagestan, Armenia, Azerbaijan and Georgia (Zakharenko & Krivokhatsky 1993).

* ***Nedroledon maculatus*** Zakharenko, 1990

1♂ – 13.05.2016, Vashlovani NP., Pantishara 41°14'N 46°21'E, 400 m asl, at light, leg R. Wąsala.

A very rare species with a characteristic wing pattern (Fig. 3). It was described on the basis of one male from Uzbekistan /голотип [holotype] ♂, Ташкент [Tashkent], 08.1911/ (Zakharenko 1990). Until now no other localities of this species had been known (Fig 4). The only specimen from the Caucasus was caught at light in the Vashlovani N.P. (Fig 5).

Fig. 4. Distribution of *Nedroledon maculatus* circle – type locality Zakharenko 1990, square – new data from the Vashlovani National Park.

Ryc. 4. Występowanie *Nedroledon maculatus* kółko – *locus typicus* (Zakharenko 1990); kwadrat – nowe stanowisko w Parku Narodowym w Vashlovani.

Fig. 5. Collecting site of *Nedroledon maculatus* in the vicinity of Pantishara in the Vashlovani National Park (photo R. Wąsala, 2016).

Ryc. 5. Stanowisko odłowu *Nedroledon maculatus* w rejonie Pantishara na terenie Parku Narodowego Vashlovani (fot. R. Wąsala, 2016).

Megistopus flavicornis (Rossi, 1790)

2♀♀ – 14.6.2014, Georgia SE, E Tbilisi, River Iori, S Sagarejo 41°4'N 45°23'E, leg. M. Snižek.

This species has been recorded in several localities in the Caucasian region (Zakharenko & Krivokhatsky 1993).

Bubopsis hamatus (Klug, 1834)

1♀ – 20–21.08.2015, Vashlovani NP., Mijnis Kure 41°06'N 46°38'E, 97 m asl, at light, leg. R. Wąsala.

A widespread species associated mainly with dry, sandy-desert habitats. Known to date mainly from the western Caucasus and Dagestan. From Georgia reported only in a general sense (Dobosz & Ábrahám 2007). It also occurs in neighbouring countries, i.e. Armenia, Azerbaijan, Turkey and Iran (Ilyina *et al.* 2013).

Libelloides ustulatus Eversmann, 1850

3♂♂ 1♀ – 14.6.2014, Georgia, W Tbilisi, N Naosari, NE Manglisi 41°44'N 44°27'E, leg. M. Snižek.

This species is reported as a subspecies of *L. hispanus* from Georgia only in a general sense. It is also known from Armenia, Azerbaijan and Turkey (Amasya, Artvin) (Aspöck *et al.* 2001, Krivokhatsky 2007).

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STRESZCZENIE

Nowe dane na temat występowowania siatkoskrzydłych (Neuroptera) w Gruzji

Gruzja to jeden z najciekawszych przyrodniczo rejonów Kaukazu, który charakteryzuje się bogatą i w wielu przypadkach endemiczną entomofauną. Dane o owadach siatkoskrzydłych tego regionu publikowane były w wielu pracach. Ze względu na liczne zmiany odnoszące się do tego terenu, które miały miejsce w XX i XXI wieku, wiele danych faunistycznych trudno jest przypisać do konkretnych państw czy autonomicznych republik leżących na obszarze szeroko rozumianego Kaukazu. Z obszaru Gruzji dotychczas wykazano 63 gatunki owadów siatkoskrzydłych. W ostatnich latach, podczas wypraw zorganizowanych przez polskich i czeskich entomologów, zebrany został interesujący materiał uzupełniający tę wiedzę o kolejne pięć gatunków: *Cueta lineosa* (Ramb.), *Neuroleon microstenus propinquus* (Nav.), *Neuroleon* (*Ganussa*) *lukhtanovi* Kriv., *Neuroleon nemausiensis piryulini* (Kriv.) i *Nedroledon maculatus* Zakh. Ponadto, w efekcie prac rewizyjnych zbiorów Instytutu Zoologii Rosyjskiej Akademii Nauk (St. Petersburg), odkryto kolejny nowy dla fauny Gruzji gatunek, tj. *Wesmaelius* (*K.*) *nervosus* (Fabr.). Obecnie na terenie Gruzji stwierdzono dotychczas 69 gatunków owadów siatkoskrzydłych.

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